



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER OF PATENTS AND TRADEMARKS
Washington, D.C. 20231
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/519,719	03/07/2000	Hamid Noorbakhsh	4150	8956

32588 7590 04/23/2003

APPLIED MATERIALS, INC.
2881 SCOTT BLVD. M/S 2061
SANTA CLARA, CA 95050

EXAMINER

ALEJANDRO MULERO, LUZ L

ART UNIT	PAPER NUMBER
----------	--------------

1763

DATE MAILED: 04/23/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 09/519,719	Applicant(s) NOORBAKHSH ET AL.	
	Examiner Luz L. Alejandro	Art Unit 1763	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 03 February 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-24 and 26-52 is/are pending in the application.
- 4a) Of the above claim(s) 1-10, 16-20 and 29-36 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 11-15, 21-24, 26-28 and 37-52 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ 6) ☐ Other: _____

DETAILED ACTION

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 11-12, 14-15, 38, 45-48, and 51 are rejected under 35 USC 102(e) as being anticipated by Masuda et al., U.S. Patent 6,171,438.

Masuda et al. shows the invention as claimed including a wall 105, a bottom, and a lid assembly defining a chamber volume; a substrate support 131 disposed within the chamber volume; and a chamber liner 103 adapted to be removably disposed in the process volume within a wall circumscribing the substrate support and proximate the lid assembly and wherein the wall is configured to line the sidewalls of the chamber; and a passage 104 at least partially formed in the liner isolated from the process volume and adapted to flow a heat transfer medium therethrough (see fig. 1 and col. 7-line 1 to col. 9-line 15). With respect to claims 14-15, note that the liner can be composed of aluminum (see col. 7-lines 37-43)

Claims 38, 47-48 and 51 are rejected under 35 USC 102(b) as being anticipated by Shinji, JP 09-275092A.

Shinji shows the invention as claimed including a liner 12 adapted to be removably disposed in the process volume within a wall and wherein the wall is configured to line the sidewalls of the chamber; and a passage at least partially formed in the liner isolated from the process volume and adapted to flow a heat transfer medium therethrough (see fig. 1 and abstract).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 13 and 39-43 are rejected under 35 USC 103(a) as being unpatentable over Masuda et al., U.S. Patent 6,171,438.

Masuda et al. is applied as above but fails to expressly disclose wherein the chamber liner is retained in the chamber by a clamp affixed to the chamber.

With respect to claim 13, official notice was taken in the office action mailed 10-11-01 and was not seasonably challenged and therefore, as noted in the office action mailed 10-23-02, these limitations are taken to be admitted prior art (see MPEP 2144.03).

Furthermore, in order to mount a proper challenge to the examiner's taking of official notice, a challenge to the taking of judicial notice must contain adequate information or argument to create on its face a reasonable doubt regarding the circumstances justifying the judicial notice (see *In re Boon*, 439 F.2d 724, 169 USPQ 231 (CCPA 1971)).

Masuda et al. does not expressly disclose that the wall of the liner is cylindrical. However, with respect to the shape of the wall, a prima facie case of obviousness still exists because the particular shape of the wall is a matter of choice which a person of ordinary skill in the art would have found obvious absent persuasive evidence that the particular configuration of the claimed wall is significant (see *In re Dailey*, 357 F.2d 669, 149 USPQ 47 (CCPA 1966)).

Claims 21-24, and 49-50 are rejected under 35 USC 103(a) as being unpatentable over Masuda et al., U.S. Patent 6,171,438 in view of Shan et al., EP 0 814 495 A2.

Matsuda et al. is applied as above but does not expressly disclose the claimed structural limitations. Shan et al. discloses an apparatus having a center member being circumscribed by a flange and from which a cylindrical wall 10 projects, wherein the lid is disposed so as to define a plenum with the wall from which a fluid is coupled to the processing volume through plurality of nozzles (see fig. 1 and page 3-line 20 to page 4-line 45, and page 9, lines 7-46). Therefore, in view of this disclosure, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the apparatus of Matsuda et al. as to comprise the center member/lid/gas supply structure taught by Shan et al. in order to optimize the apparatus since such arrangement will provide for a more uniform distribution of the gas(es) into the chamber and towards the substrate.

Claims 39-41 and 43 are rejected under 35 USC 103(a) as being unpatentable over Shinji, JP 09-275092A.

Shinji does not expressly disclose that the wall of the liner is cylindrical. However, with respect to the shape of the wall, a prima facie case of obviousness still exists because the particular shape of the wall is a matter of choice which a person of ordinary skill in the art would have found obvious absent persuasive evidence that the particular configuration of the claimed wall is significant (see *In re Dailey*, 357 F.2d 669, 149 USPQ 47 (CCPA 1966)).

Art Unit: 1763

Claims 11-15, 38-41, 43-48, and 51 are rejected under 35 USC 103(a) as being unpatentable over Pu et al., WO 99/48130 in view of Masuda et al., U.S. Patent 6,171,438.

Pu et al. shows the invention substantially as claimed including a processing chamber comprising: a wall 12, a bottom wall 14, and a lid assembly 10 defining a chamber volume; a substrate support disposed within the chamber volume; and chamber liner 26,27 disposed in the chamber volume and proximate the lid assembly and also circumscribing the substrate support (see fig. 1 and page 4-line 14 to page 5-line 25).

Pu et al. fails to expressly disclose a passage at least partially disposed in the chamber liner, the passage fluidly isolated from the chamber volume and having an inlet and an outlet adapted to flow a fluid through the passage. Masuda et al. discloses an apparatus comprising a heat exchangeable jacket 103 disposed within a chamber liner in order to control the temperature of the inner wall 102 (see fig. 1 and col. 7-lines 23-43). In view of this disclosure, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the apparatus of Pu et al. so as to further comprise a heat exchangeable medium in the chamber liner structure as taught by Masuda et al. because this: a) will allow for temperature control of the inner wall, and b) will reduce contamination by forming a polymerized film on the liner walls (see abstract).

With respect to claim 13, official notice was taken in the office action mailed 10-11-01 and was not seasonably challenged and therefore, as noted in the office action

mailed 10-23-02, these limitations are taken to be admitted prior art (see MPEP 2144.03). Furthermore, in order to mount a proper challenge to the examiner's taking of official notice, a challenge to the taking of judicial notice must contain adequate information or argument to create on its face a reasonable doubt regarding the circumstances justifying the judicial notice (see *In re Boon*, 439 F.2d 724, 169 USPQ 231 (CCPA 1971)).

Claims 21-24, and 49-50 are rejected under 35 USC 103(a) as being unpatentable over Pu et al., WO 99/48130 in view of Masuda et al., U.S. Patent 6,171,438 as applied to claims 11-15, 38-41, 43-48, and 51 above, and further in view of Shan et al., EP 0 814 495 A2.

Pu et al. and Masuda et al. are applied as above but do not expressly disclose the claimed structural limitations. Shan et al. discloses an apparatus having a center member being circumscribed by a flange and from which a cylindrical wall 10 projects, wherein the lid is disposed so as to define a plenum with the wall from which a fluid is coupled to the processing volume through plurality of nozzles (see fig. 1 and page 3-line 20 to page 4-line 45, and page 9, lines 7-46). Therefore, in view of this disclosure, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the apparatus of Pu et al. modified by Masuda et al. as to comprise the center member/lid/gas supply structure taught by Shan et al. in order to optimize the apparatus since such arrangement will provide for a more uniform distribution of the gas(es) into the chamber and towards the substrate.

Claim 42 is rejected under 35 U.S.C. 103(a) as being unpatentable over Pu et al., WO 99/48130 in view of Masuda et al., U.S. Patent 6,171,438 as applied to claims 11-15, 38-41, 43-48, and 51 above, and further in view of Collins et al. WO 97/08734

Shan et al. and Masuda et al. do not expressly disclose a passage that the passage is formed at least partially in the bottom. Collins et al. discloses an apparatus having a liner 2150 disposed adjacent the bottom of the chamber and thermally coupled to a cold sink 2155 (see fig. 48A and page 65-line 34 to page 66-line 18). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the apparatus of Shan et al. modified by Masuda et al. as to further comprise the cold sink as taught by Collins et al. in order to optimize the apparatus by maintaining a temperature well-below the polymer condensation temperature, therefore avoiding the risk of contamination.

Claims 11-15, 21-24, 38-41, 43-51 are rejected under 35 USC 103(a) as being unpatentable over Shan et al., EP 0 814 495 A2 in view of Masuda et al., U.S. Patent 6,171,438.

Shan et al. shows the invention substantially as claimed including a processing chamber comprising: a wall 20, a bottom wall 20, and a lid assembly 37 defining a chamber volume; a substrate support 30 disposed within the chamber volume; and a chamber liner disposed in the chamber volume and proximate the lid assembly and also circumscribing the substrate support 30 (see fig. 1 and page 3, line 24 to page 4, line 45).

Shan et al. does not expressly disclose a passage at least partially disposed in the chamber liner, the passage fluidly isolated from the chamber volume and having an inlet and an outlet adapted to flow a fluid through the passage. Masuda et al. discloses an apparatus comprising a heat exchangable jacket 103 disposed within a chamber liner in order to control the temperature of the inner wall 102 (see fig. 1 and col. 7-lines 23-43). In view of this disclosure, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the apparatus of Shan et al. so as to further comprise a heat exchangeable medium in the chamber liner structure as taught by Masuda et al. because such structure is known to be a suitable alternative for controlling the temperature of the side wall and to reduce contamination by forming a polymerized film on the liner walls.

With respect to claim 13, official notice was taken in the office action mailed 10-11-01 and was not seasonably challenged and therefore, as noted in the office action mailed 10-23-02, these limitations are taken to be admitted prior art (see MPEP 2144.03). Furthermore, in order to mount a proper challenge to the examiner's taking of official notice, a challenge to the taking of judicial notice must contain adequate information or argument to create on its face a reasonable doubt regarding the circumstances justifying the judicial notice (see *In re Boon*, 439 F.2d 724, 169 USPQ 231 (CCPA 1971)).

Claims 26 and 28 are rejected under 35 USC 103(a) as being unpatentable over Shan et al., EP 0 814 495 A2 in view of Zhao et al., EP 0 855 735 A2.

Shan et al. is applied as above and further discloses that the liner has a plurality of apertures formed at least partially therein; a lid having an inlet, the lid disposed proximate the liner and defining a plenum at least partially therebetween (see fig. 1). Shan et al. does not expressly disclose that a nozzle is disposed in at least one of the apertures. Zhao et al. discloses an apparatus having a showerhead 40 that includes nozzles 42 (see col. 14, lines 43-51. Therefore, in view of this disclosure, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the apparatus of Shan et al. so as to use a showerhead comprising nozzles since such means are known in the art to effectively and efficiently introduce processing gases into the processing chamber.

Claim 27 is rejected under 35 USC 103(a) as being unpatentable over Shan et al., EP 0 814 495 A2 in view of Zhao et al., EP 0 855 735 A2 as applied to claims 26 and 28 above, and further in view of Takeuchi et al., U.S. Patent 5,824,158.

Shan et al., and Zhao et al. are applied as above but fail to expressly disclose that the nozzles are comprised of any of the claimed materials. Takeuchi et al. discloses a processing apparatus in which a nozzle made of quartz is used as to prevent the inclusion of impurities in the process gas (see col. 11-lines 53-56). In view of this disclosure, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the apparatus of Shan et al. modified by Zhao et al. so as to include nozzles made of quartz because this will prevent the incursion of impurities into the process gas.

Claim 37 is rejected under 35 USC 103(a) as being unpatentable over Shan et al., EP 0 814 495 A2 in view of Zhao et al., EP 0 855 735 A2 as applied to claims 26 and 28 above, and further in view of Banholzer et al., U.S. Patent 5,565,058.

Shan et al., and Zhao et al. are applied as above but do not expressly disclose that the liner comprises a textured surface. Banholzer et al. discloses a vacuum chamber comprising a liner that is treated to roughen its surface to create a textured surface for increasing adhesion of materials deposited thereon during substrate processing. Therefore, in view of this disclosure, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the apparatus of Shan et al. modified by Zhao et al. as to texture the interior surface of the liner in order to increase adhesion of materials deposited thereon during substrate processing.

Claim 42 is rejected under 35 U.S.C. 103(a) as being unpatentable over Shan et al., EP 0 814 495 A2 in view of Masuda et al., U.S. Patent 6,171,438 as applied to claims 11-15, 21-24, 38-41, 43-51 above, and further in view of Collins et al. WO 97/08734

Shan et al. and Masuda et al. do not expressly disclose that the passage is formed at least partially in the bottom. Collins et al. discloses an apparatus having a liner 2150 disposed adjacent the bottom of the chamber and thermally couple to a cold sink 2155 (see fig. 48A and page 65-line 34 to page 66-line 18). Therefore, it would

Art Unit: 1763

have been obvious to one having ordinary skill in the art at the time the invention was made to modify the apparatus of Shan et al. modified by Masuda et al. as to further comprise the cold sink as taught by Collins et al. in order to optimize the apparatus by maintaining a temperature well-below the polymer condensation temperature, therefore avoiding the risk of contamination.

Claim 52 is rejected under 35 U.S.C. 103(a) as being unpatentable over Shan et al., EP 0 814 495 A2 in view of Masuda et al., U.S. Patent 6,171,438. as applied to claims 11-15, 21-24, 38-41, 43-51 above, and further in view of Zhao et al., EP 0 855 735 A2.

Shan et al. and Masuda et al. are applied as above and Shan et al. further discloses that the liner has a plurality of apertures formed at least partially therein; a lid having an inlet, the lid disposed proximate the liner and defining a plenum at least partially therebetween (see fig. 1). Shan et al. and Masuda et al. do not expressly disclose that a nozzle is disposed in at least one of the apertures. Zhao et al. discloses an apparatus having a showerhead 40 that includes nozzles 42 (see col. 14, lines 43-51). Therefore, in view of this disclosure, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the apparatus of Shan et al. modified by Masuda et al. so as to use a showerhead comprising nozzles since such means are known in the art to effectively and efficiently introduce processing gases into the processing chamber.

Response to Arguments

Applicant's arguments with respect to claims 11-15, 21-24, 26-28, and 37-52 have been considered but are moot in view of the new ground(s) of rejection.

With respect to the taking of official notice, the examiner contends that such taking of official notice was and is proper. Note that if the official notice to an office action is not seasonably challenged, then the limitations are taken to be admitted prior art. Since the official notice taken in the first office action was not challenged in the second office action, a seasonable challenge of the official notice was not made and therefore as correctly pointed out in MPEP 2144.03, considering these limitations to be admitted prior art is proper.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Luz L. Alejandro whose telephone number is 703-305-4545. The examiner can normally be reached on Monday to Thursday from 7:30 to 6:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gregory L. Mills can be reached on 703-308-1633. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9310 for regular communications and 703-872-9311 for After Final communications.

Art Unit: 1763

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0661.

A handwritten signature in black ink, appearing to read 'Luz L. Alejandro', is positioned above the printed name.

Luz L. Alejandro
Primary Examiner
Art Unit 1763

April 21, 2003